

REMARKS

Claims 1-7, 9, 11-20 and 22-48 are pending in the application. Of these claims, claims 12-20, 22, 23 and 30-33 are withdrawn from consideration. Claims 8, 10 and 21 were previously cancelled. Claims 34-48 were previously added.

Claims 1-4, 9, 11, 24, 28, 29, 34-36, 39, 41, 42 and 46-48 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,327,016 to Yamada et al., hereinafter "Yamada". Claims 1, 11, 34 and 48 are independent. Applicants respectfully traverse this rejection.

Claim 1 provides a liquid crystal device including a first cell wall and a second cell wall enclosing a layer of liquid crystal material, electrodes for applying an electric field across at least some of the liquid crystal material, and a surface alignment structure on the inner surface of at least the first cell wall providing a single desired uniform alignment to a liquid crystal director. The surface alignment structure includes a two dimensional array of alignment posts which are formed from a photoresist material or a plastics material, and which are shaped and oriented to produce the desired alignment.

Yamada discloses an Axially Symmetrically-aligned Microcell (ASM) mode liquid crystal display that provides wide viewing angle characteristics by reducing variations in contrast at different viewing angles. This is achieved by constructing the cell to have an array of small domains, i.e., microcells. Within each microcell, the liquid crystal molecules have a tilted alignment that is axially symmetrical about a central axis perpendicular to the plane of the cell walls. This alignment is achieved by using protrusion-like structures which have sloping side walls and which are treated with a vertical alignment layer to induce adjacent liquid crystal molecules to align vertically with respect to the local plane of the sloping side wall. Thus, the tilt angle of the liquid crystal molecules relative to the plane of the cell walls is determined by the slope of the side walls in the absence of an electric field. A liquid crystal material of negative dielectric anisotropy is used so that when a field is applied, the liquid crystal molecules tend to

align parallel to the plane of the cell walls. Yamada also discloses a pit region at the top of each protrusion-like structure, which provides axially-symmetrical alignment of the liquid crystal molecules at the top portion of the protrusion-like structures.

Yamada discloses a liquid crystal display in which liquid crystal molecules are aligned symmetrically about a central axis of each protrusion-like structure. Thus, **Yamada requires that the alignment vary** across each microcell of the display, i.e., vary from one protrusion-like structure to any adjacent protrusion-like structure. This characteristic is a fundamental requirement of the ASM mode liquid crystal display in order to achieve its wide viewing angle characteristics. In contrast, claim 1 provides a surface alignment structure that provides a **single desired uniform alignment**, where the liquid crystal molecules are oriented in the same direction over an area of the display in which the surface alignment is provided. Therefore, Yamada does not disclose a liquid crystal device having "a surface alignment structure on the inner surface of at least said first cell wall providing a single desired uniform alignment to a liquid crystal director," as recited in claim 1.

Thus, Yamada fails to disclose or suggest the elements of claim 1. Therefore, claim 1 is patentable over Yamada.

Claims 2-4, 9, 24, 28 and 29 depend from claim 1. For at least reasoning similar to that provided in support of claim 1, claims 2-4, 9, 24, 28 and 29 are patentable over Yamada.

Claims 11, 34 and 48 recite features similar to those recited in claim 1. For at least reasoning similar to that provided in support of the patentability of claim 1, claims 11, 34 and 48 are patentable over Yamada.

Claims 35, 36, 39, 41, 42, 46 and 47 depend from claim 34. For at least reasoning similar to that provided in support of claim 34, claims 35, 36, 39, 41, 42, 46 and 47 are patentable over Yamada.

For the reasons set forth above, the rejection of 1-4, 9, 11, 24, 28, 29, 34-36, 39, 41, 42 and 46-48 under 35 U.S.C. 102(e) as anticipated by Yamada is overcome. Applicants respectfully request that the rejection of claims 1-4, 9, 11, 24, 28, 29, 34-36, 39, 41, 42 and 46-48 be reconsidered and withdrawn.

Claims 7 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada in view of Japanese Patent No. 5-249463, hereinafter "JP'463". Claim 7 depends from claim 1, and claim 40 depends from claim 34. Applicants respectfully traverse this rejection.

As discussed above, Yamada discloses a liquid crystal display in which the alignment varies across each microcell of the display. However, Yamada does not disclose a liquid crystal device having "a surface alignment structure on the inner surface of at least said first cell wall providing a single desired uniform alignment to a liquid crystal director," as recited in claim 1.

JP'463 discloses surfactants for use as layers on oriented films or adding surfactant into a liquid crystal. However, JP'463 does not disclose a liquid crystal device including a surface alignment structure, or "a surface alignment structure on the inner surface of at least said first cell wall providing a single desired uniform alignment to a liquid crystal director," as recited in claim 1.

Neither Yamada nor JP'463 disclose or suggest a liquid crystal device including "a surface alignment structure on the inner surface of at least said first cell wall providing a single desired uniform alignment to a liquid crystal director," as recited in claim 1. Therefore, neither Yamada nor JP'463, whether considered alone or in combination, discloses or suggests the elements of claim 1. Thus, claim 1 is patentable over the cited combination of Yamada and JP'463.

Claim 34 includes recitals similar to those of claim 1. For at least reasoning similar to that provided in support of the patentability of claim 1, claim 34 is patentable over the cited combination of Yamada and JP'463.

Claim 7 depends from claim 1, and claim 40 depends from claim 34. For at least reasoning similar to that provided in support of claims 1 and 34, claims 7 and 40 are patentable over the cited combination of Yamada and JP'463.

For the reasons set forth above, the rejection of claims 7 and 40 under 35 U.S.C. 103(a) as unpatentable over Yamada in view of JP'463 is overcome. Applicants respectfully request that the rejection of claims 7 and 40 be reconsidered and withdrawn.

Claims 25-27 and 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada. Claims 25-27 depend from claim 1, and claims 43-45 depend from claim 34. Applicants respectfully traverse this rejection.

As discussed above, Yamada does not disclose a liquid crystal device having "a surface alignment structure on the inner surface of at least said first cell wall providing a single desired uniform alignment to a liquid crystal director," as recited in claim 1, and therefore Yamada does not disclose the elements of claim 1. Thus, claim 1 is patentable over Yamada.

Claim 34 includes recitals similar to those of claim 1. For at least reasoning similar to that provided in support of the patentability of claim 1, claim 34 is patentable over Yamada.

Claims 25-27 depend from claim 1, and claims 43-45 depend from claim 34. For at least reasoning similar to that provided in support of claims 1 and 34, claims 25-27 and 43-45 are patentable over Yamada. Applicants respectfully request that the rejection of claims 7 and 40 be reconsidered and withdrawn.

Claims 5, 6, 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada in view of U.S. Patent No. 4,232,947 to Funada et al., hereinafter "Funada". Claims 5 and 6 depend from claim 1, and claims 37 and 38 depend from claim 34. Applicants respectfully traverse this rejection.

As discussed above, Yamada does not disclose a liquid crystal device having "a surface alignment structure on the inner surface of at least said first cell wall providing a single desired uniform alignment to a liquid crystal director," as recited in claim 1.

Funada discloses a liquid crystal display including microgroove structures. However, Funada does not disclose a liquid crystal device having "a surface alignment structure on the inner surface of at least said first cell wall providing a single desired uniform alignment to a liquid crystal director; wherein said surface alignment structure comprises a two dimensional array of alignment posts," as recited in claim 1.

Neither Yamada nor Funada disclose or suggest a liquid crystal device including "a surface alignment structure on the inner surface of at least said first cell wall providing a single desired uniform alignment to a liquid crystal director," as recited in claim 1. Therefore, neither Yamada nor Funada, whether considered alone or in combination, discloses or suggests the elements of claim 1. Thus, claim 1 is patentable over the cited combination of Yamada and Funada.

Claim 34 includes recitals similar to those of claim 1. For at least reasoning similar to that provided in support of the patentability of claim 1, claim 34 is patentable over the cited combination of Yamada and Funada.

Claims 5 and 6 depend from claim 1, and claims 37 and 38 depend from claim 34. For at least reasoning similar to that provided in support of claims 1 and 34, claims 5, 6, 37 and 38 are patentable over the cited combination of Yamada and Funada.

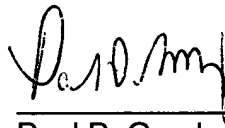
For the reasons set forth above, the rejection of claims 5, 6, 37 and 38 under 35 U.S.C. 103(a) as unpatentable over Yamada in view of Funada is overcome. Applicants respectfully request that the rejection of claims 5, 6, 37 and 38 be reconsidered and withdrawn.

An indication of the allowability of all pending claims by issuance of a Notice of Allowability is earnestly solicited.

Respectfully submitted,

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Date



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